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By the Authority Vested By Part 5 of the United States Code § 552(a) and Part 1 of the Code of Regulations § 51 the attached document has been duly INCORPORATED BY REFERENCE and shall be considered legally binding upon all citizens and residents of the United States of America. *HEED THIS NOTICE*: Criminal penalties may apply for noncompliance.

Document Name: SAE J945: Vehicular Hazard Warning Signal Flashers

CFR Section(s): 49 CFR 571.108 Table I

Standards Body: Society of Automotive Engineers

APPROVED

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VEHICULAR HAZARD WARNING SIGNAL FLASHER — SAE J945

SAE Recommended Practice

Report of Lighting Committee approved February 1966. Editorial change February 1968.

Definition—A vehicular hazard warning flasher is a device which, as long as it is turned on, causes all the required signal lamps listed in SAE J910 to flash.

Scope—Flashers referred to in this SAE Recommended Practice are for nominal 6 v d-c or 12 v d-c circuits as specified by the manufacturer, and are required to operate from two signal lamps to the maximum design load, including pilot lamps, as stated by the manufacturer.

Samples Required and Selection for Tests—Fifty flashers, which shall be representative of those regularly manufactured and marketed, shall be submitted for test. Samples shall include means of connection into the lighting circuit if other than the standard sealed beam type plug-in connector is used. The maximum design load for the hazard warning signal flasher and the mounting position (if necessary) shall be specified by the manufacturer. All flashers for test shall be selected initially at random from the sample lot.

Test Circuitry and Equipment Requirements—See SAE J823. The standard test circuit is shown therein.

Pilot Indication—The means of producing the visible pilot indication required in the hazard warning signal system may be incorporated in the flasher. A means of producing an audible signal also may be incorporated in the flasher. The "means" shall function satisfactorily under all the test conditions that are applied to the flasher.

Performance Requirements—The performance requirements shall be based upon a test of 20 samples chosen at random from the initial lot

of 50. At least 17 of the 20 samples shall meet the following requirements:

1. Starting Time—A flasher having normally closed contact shall open (turn off) within 1.5 sec after voltage is applied. A flasher having normally open contacts shall complete the first cycle (close the contacts and then open the contacts) within 1.5 sec after voltage is applied. The test shall be made in an ambient temperature of 75 ± 10 F with the minimum and maximum load connected, and the power source for test circuit adjusted to apply design voltage at the bulbs. Compliance shall be based on an average of three starts, which shall be separated by a cooling interval of 5 minutes.

2. Voltage Drop—The test shall be made in an ambient temperature of 75 ± 10 F with the maximum design load connected and the power source for the test circuit adjusted to apply design voltage at the bulbs. The lowest voltage drop during the "on" period, measured between the input and the load terminals after the flashers have completed a minimum of five consecutive cycles, shall not exceed 0.45 v.

3. Flash Rate and Percent Current "On" Time—The flash rate and the percent current "on" time of normally closed type flashers shall be within the unshaded portion of the polygon shown in Fig. 1. The flash rate and percent current "on" time of normally open type flashers shall be within the entire rectangle shown, including the shaded areas.

Flashing rate and percent current "on" time shall be measured after the flashers have been operating for a minimum of five consecutive cycles and shall be an average of at least three consecutive cycles. The previous operating tolerances shall apply for loads of two signal lamps and the maximum design load, including pilot lamps, as specified by the manufacturer, over combinations of bulb voltages and ambient temperatures tabulated:

(a) 12.8v (or 6.4v) and 75 ± 10F.
(b) 11.0v (or 5.5v) and 0 ± 5F.
(c) 13.0v (or 6.5v) and 0 ± 5F.

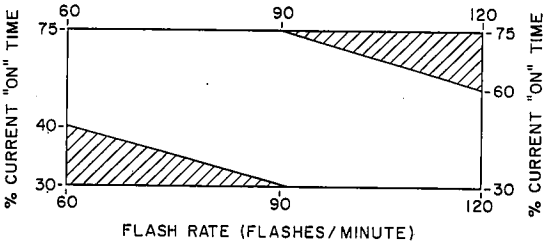

FIG. 1—FLASH RATE (FLASHES PER MINUTE)

(d) 11.0v (or 5.5v) and 125 ± 5F.
(e) 13.0v (or 6.5v) and 125 ± 5F.

Durability Test Requirements—A random selection of 20 flashers from the remaining 30 samples conforming to paragraphs 1, 2, and 3 (a) under Performance Requirements shall be subject to a durability test. The test shall be run with the maximum design load connected into the standard test circuit specified in SAE J823 and the power source for the test circuit adjusted to apply and maintain 13.0 v (or 6.5 v) according to the flasher rating to the input terminals of the test circuit throughout the test.

Flashers shall flash continuously for a total time of 36 hr in an ambient temperature of 75 ± 10 F.

At the conclusion of the durability test, each flasher shall be tested in the standard test circuit with the minimum of two signal lamp bulbs and maximum design load, including pilot lamps, as specified by the manufacturer. The power source for the test circuit shall be adjusted to apply design voltage at the bulbs. The ambient temperature shall be 75 ± 10 F.

At least 17 of the samples tested shall comply with the provisions of paragraphs 1, 2 and 3 (a) under Performance Requirements.